Before the
Federal Communications Commission
Washington, DC 20554

In the Matter of:)
Request for a Digital Power increase for Terrestrial) MM Docket
Radio Broadcasting Using the Hybrid Mode of the) #99-325
HD Radio System)

Comments of WCPE FM, Raleigh, NC
Educational Information Corporation
on a proposal to increase the average
IBOC power by 10 dB.

I am greatly concerned by the proposal and wish to ask the Commission to consider the following facts, opinions, and suggestions.

I suggest that the parties bifurcate the proceeding; only proceed in this proposal with stations in the commercial part of the band. Most of the petitioners promoting this option operate only commercial stations; most commercial stations only care about listeners in their city grade contours, with 10 dB higher signal strength than their protected contours. Increasing their IBOC sidebands will do them little harm as they mainly care only about their city of license, advertisers, and citizens within such. Thus, their city grade contour becomes their new protected contour with a 10 dB higher IBOC signal.

However, in stark contrast, non-commercial educational stations rely upon every listener they can reach, including those as far away as their 34 dBu contour. Additionally, the reserved part of the band uses a different method to calculate spacing and allocation. It just makes sense to split this proceeding into two distinct parts -- one for the reserved band; one for the commercial band. Let the proceeding for the commercial part of the band go forth. Hold action in the reserved part of the band until experience is gained from increased IBOC operation in the real world in the commercial part of the band.

Besides, a public radio station that wants a 10 dB ratio can have it right now -- simply decrease the analog signal by 10 dB. The FCC can give them mileage protection to their old 60 dBu contour, which now will be approximately their 50 dBu contour. And every radio engineer knows that reception at the 50 dBu contour is just fine, even for stereo with it's 23.5 dB S/N penalty. Changing the value of the protected contour is not a new idea; Class B stations already do it. Alternatively, let the station go to full digital mode and drop analog altogether; that will solve the building penetration problem without increasing sideband power.

And let's look further at that -20 dB adjacent channel mask to begin with. That was supposed to be for one carrier, not a slew of them, and it was supposed to be for not more than 50% of the locations at not more than 10% of the time -- F(50,10), remember? As it stands now, IBOC is operating multiple carriers at 100% of the locations at 100% of the time -- a F(100,100) situation. Seems to me that if someone does the math and adds all those carriers together they'd see that IBOC already has about a 10 dB increase over the intent of the original F(50,10) mask as things are right now! And I'd like to know what radio station would not raise cain with two other outside radio stations proposing to co-locate on their tower, broadcasting with 10% power on both their upper and lower first-adjacent channels. Let's give this some thought, guys; the vast majority of your listeners are using analog radio and you're going to cause double first-adjacent interference to yourself.

And let's be fair. The decision to lose coverage area to increased digital signal sidebands should be left up to the station receiving the interference, not the station desiring to increase power. It's called the "protected" contour for a reason, which need not be further explained. In a situation which WCPE found itself wishing to increase power, it caused a small amount of interference and received a small amount of interference with the two other radio stations; but all stations were aware of the situation and all stations agreed to the

changes. This should be the rule here; any station potentially receiving interference should have the right to refuse or agree. If some choose to agree via some settlement method, fine. If not, the 1% level -- already too high as previously discussed -- must be held to.

In the case of NCE stations who have donors in any part of the area of which their signal is receiveable, yet has increased IBOC forced upon it, it should be the right of the station losing the donor to be annually reimbursed financially by the station increasing the digital signal and causing harmful interference to the former donor. A statement from the donor attesting that they can no longer enjoy the station they supported, that they will cease to donate, can allow the interfered with station to use their donor's past annual giving history to set the amount of the annual financial compensation for the loss of the donor's support, adjusted by the annual consumer price index. Neither is this a new idea. The government compensated commercial stations who lost coverage area from the Cuban government's stations operating on US domestic frequencies when the US was operating Radio Marti; so a precedent is already set.

And let's look at numbers of analog versus digital radios. The cart is being put miles in front of the horse. There are about 1,000,000,000 analog FM receivers in use. Ibiquity is said to have made about 600,000 chipsets total during this year; a clearly insignificant number of radios to allow consideration of the destruction of any part of some innocent radio stations' protected analog coverage area. The FCC should take no action on this proposal until there is parity in the number of digital and analog receivers in use. That might be the time to switch to full digital mode anyway, making this whole proposal moot.

Further, in the proceeding seeking comment that radios be able to receive IBOC, Sirius Satellite, and XM service, hardly anyone was a proponent of IBOC; few comments were received (thirty, I believe). Does this show a great public interest in IBOC?

But let's really think about the future and what's best. IBOC is still an experimental system, not a standard. Is it not fair to look at it as a failed experiment? Even Canada has said that it is a flawed system; Mexico isn't using it either. Consider how digital radio would be done here in the US if we started planning it today -- we would put a subcarrier on each analog station, and the digital information would be referenced to and broadcast within the old Channel 5 and 6 bandspace. We would have no buzzsaw interference at all in the FM band, we would have maximum coverage for both digital and analog systems, and we would have a system that would have no technical compromises or arguments. Let's do it right knowing what we now know; the concurrent proposal to add new FM stations in channel 5 and 6 space is just a cleaver and diversionary excuse to try to give a flawed reason why we don't want our digital sidebands down there. It would be an even longer time before any radios were made that could receive signals in that band, whereas IBOC radios could have chips made to look for those frequencies; IBOC transmitters could be retuned to transmit in that adjacent band, and a changeout of the IBOC transmitting antenna and a bit of other engineering tweaking would complete the transition -- without causing interference to a single analog station or analog listener. Now what is better for the American listener's desires and convenience? And let me add that the transmission system would be a lot simpler and more efficient; no lossy combiners would be needed; no precious electrical energy would be dumped to heat; only needed would be simple bandpass combiners as already commonly used on master FM antenna systems.

Regardless of whatever system is finally adopted, all the patent rights and royalty requirements should be dropped, abandoned, and nullified. There is precedent for this both in Stereophonic FM broadcasting and color TV NTSC broadcasting. There should not be a payment or royalty requirement for a mandated broadcasting scheme. These are public airwaves, not some patent holder's.

The Commission's primary (and only) responsibility is to protect the listener against interference. Again, it is called a

protected contour for a reason and the FCC is supposed to protect the public's reception from the listener's point of view.

Every broadcast service except FM has a designated and somewhat protected secondary service area. NCE stations had to give protection to Channel 6 station's Grade B contours. It is well known that FM is useful out to the 50 uV/m contour -- this even had to be shown on coverage maps in the past. Even today, the definition of "protected" contour varies according to the class of the station. FM stations should have a protected secondary contour too, just as every other AM, VHF, and UHF broadcasting service has. After all, a listener doesn't care what contour he is located in; he just cares to be able to listen to his favorite station. I believe it is the duty of the FCC to protect that listener's rights.

NPR has indicated that a 40 dB signal to noise ratio is acceptable to the average listener when considering IBOC style buzzsaw interference. For stations that have highly compressed audio, their signal should be protected to their current protected contour. But for stations which broadcast with a relatively high dynamic range, such as classical music stations with light compression yielding a 20 dB dynamic range, such stations should be protected to their 40 dBu F(50,50) contour to maintain that 40 dB S/N inside their protected 60 dBu contour during times that they are modulating 20 dB below the average station against which NPR made that 40 dB determination.

This 40 dB suggestion is also contrary to FCC Rules and Regulations, which state that an FM station should have a 60 dB minimum signal to noise ratio from the input terminals of the microphone through the final system. I take this to also mean that a 60 dB S/N ratio should be available to the average radio receiver at the bounds of the protected contour.

I would like to see proof that a typical FM analog receiver can provide that S/N ratio with even 1% IBOC, much less 10%.

And speaking of the protected contour, any suggestion that

such a significant portion of a station's protected contour be trashed should have nullified this proposal from the start; it never should have been given consideration by the Commission's engineering department.

Finally, the speed of this proceeding is like that of a jet transport; much more time and consideration should be given to this issue. If one did not know better, it could be said that some want to settle this issue before the new Administration takes office and makes appointments to the FCC. This proposal, potentially reducing station's analog coverage area by 20 percent -- and thus their potential revenue by 20% in a time of economic crisis, should be able to receive consideration and comment by the new Administration. Quite frankly, WCPE simply cannot take a 20% cut in donations and survive and provide a decent public service; this flys against the principles of the creation of the public radio service in the first place. It should not be railroaded through in such a stealthy and rapid manner (remember that the original closing date for comments was the day after Thanksgiving, and then only one week was added when that was called to question). I dare say that the majority of the smaller public radio stations and low power FM stations have no knowledge of this matter at all, and even less knowledge of how to comment on the matter. This proposal is of such magnitude that the Commission should send a complete and detailed letter to every FM station in the country to ensure that all voices, and especially the voices of the stations potentially suffering new interference, have an adequate chance to make an informed comment and voice their rights and concerns.

Not considered by many is that many NCE translators receive their signal directly from the host station, and are not legally able to receive their signal otherwise. These translators should be protected against reception interference from any digital signal.

Based upon the small number of digital receivers in use after such a long time, the marketplace has already spoken. Go into almost any store and ask for a digital radio -- you get led

to satellite radio; most stores not even stocking IBOC radios let alone knowing what they are. I believe that IBOC is a failure just as FM Quad was. Let's not repeat the mistake; money invested in IBOC should be viewed as an investment in knowledge; knowledge that co-channel self-interfering buzzsaws isn't the way to go. Use that old channel 5 and 6 spectrum instead, and do this the right way for future generations. Don't throw more good money after bad, and don't bury your head in the sand and say this is a good system when no other country in the world has paralleled it. Remember, when we developed television, every country in the world copied the way we did it; maybe not with exactly the same line rate or vertical rate or scanning lines, but it was a NTSC-like copy none-the-less. However, no one at all is copying our IBOC system. That should speak volumes.

Consider that the digital signal quality isn't as good as the analog system's quality! Remember the advertisements for audio processors which claim that their system can make the digital system sound "as good as analog". Recall the testing which determined that female voices and sibilance sounded "harsh"? IBOC is just plain inferior to standard analog FM. Good radio engineers will also recall that phase modulation is theoretically the most efficient type of modulation that exists.

Consider the number of times during the Olympics that you saw freeze-framing and pixilation in the video signal, and time discrepancy and lip sync problems. And that was with professional equipment. Consider that "digital" does not mean "magic" or "flawless". FM IBOC just isn't working as advertized. Allow me to point out that it is neither "in band" nor "on channel". If it was, we would not be needing this proceeding.

Consider the problems with a digital system in an emergency and a disaster situation. One can live with a static-ridden but audible FM analog system, and even have their life saved with emergency weather information. But IBOC in the same situation; forget it. Short battery life, cliff effect, and no amount of power increase is going to help when someone is dug in inside a shelter unless it's the shelter of the FM station to begin with.

In closing, we have one last chance to get it right; let's not turn the FM band into a night-time AM band filled with buzz-saws taking the place of AM hetrodynes and zero-beating co-channel skywave fluttering. Let's learn from what has happened and stop and do it right the second time. Truly, IBOC has measured once and is now having to cut twice. And the cut it's trying is against an innocent adjacent channel station, not the IBOC station trying use brute force to make a poor scheme work just a little bit better for a minuscule number of radios it hopes, but cannot guarantee, will someday be around years from now.

Mr. FCC, it's your job to see that we can say that this got done the right way when we look back on everything that went on. A lot of broadcast stations and manufacturers have spent a lot of money on this system, but from a purely engineering and public service standpoint that does not in any way, shape, or form mean that it is a good system for the FCC to endorse. Just because so much time and effort has been thrown into this system does not make it more technically worthy, or in any way more in the public interest, convenience, or necessity. Does the Commission have the independent objectivity and fortitude to say this was a nice try but the buzzsaw method just doesn't cut it?

The CBC did.

In their "Digital Radio Research, Inc., EIA/NRSC DAB System Lab Test Results" report the Canadians said "FM IBOC systems would produce unacceptable interference to their "host" FM stations, as well as to nearby stations that operate on adjacent frequencies. FM IBOC systems would produce substantially-reduced service coverage ... and degrades considerably, even to the point of failure, in the presence of multipath."

We're going to be living with this for the rest of our lives. Let's get it right the second time.

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